

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. Canceled.

2. Canceled.

3. Canceled.

4. Canceled.

5. Canceled.

6. Canceled.

7. Canceled.

8. (currently amended) ~~The method of claim 1, further comprising the steps of:~~

A method to control access to logical volumes disposed in an information storage and retrieval system using parallel access volumes, comprising the steps of:

providing an information storage and retrieval system comprising a plurality of logical volumes;

providing a plurality of host computers, wherein each of said plurality of host computers is capable of communicating with said information storage and retrieval system;

forming (N) host computer groups, wherein (N) is greater than or equal to 1;

assigning each host computer to the a host computer group;

forming (N) logical volume groups;

assigning one or more of said plurality of logical volumes to a logical volume group;

creating a parallel access volume having an alias;

persistently associating said parallel access volume with a base logical volume, wherein said base logical volume is assigned to the (i)th logical volume group, wherein (i) is greater than or equal to 1 and less than or equal to (N);

permitting each host computer assigned to the (i)th host computer group to access said parallel access volume;

receiving a request to assign to a logical volume group the base logical volume associated with a parallel access volume;

determining if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume;

operative if the base logical volume associated with said parallel access volume does not differ from the original base logical volume associated with said parallel access volume, assigning the base logical volume associated with said parallel access volume to said logical volume group;

operative if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume:

reassigning the alias for said parallel access volume to said original base logical volume; and

assigning to said logical volume group said base logical volume associated with said parallel access volume.

9. (currently amended) ~~The method of claim 1, further comprising the steps of:~~

A method to control access to logical volumes disposed in an information storage and

retrieval system using parallel access volumes, comprising the steps of:

providing an information storage and retrieval system comprising a plurality of logical volumes;

providing a plurality of host computers, wherein each of said plurality of host computers is capable of communicating with said information storage and retrieval system;

forming (N) host computer groups, wherein (N) is greater than or equal to 1;

assigning each host computer to the a host computer group;

forming (N) logical volume groups;

assigning one or more of said plurality of logical volumes to a logical volume group;

creating a parallel access volume having an alias;

persistently associating said parallel access volume with a base logical volume, wherein said base logical volume is assigned to the (i)th logical volume group, wherein (i) is greater than or equal to 1 and less than or equal to (N);

permitting each host computer assigned to the (i)th host computer group to access said parallel access volume.

receiving a request to unassign from a logical volume group the base logical volume associated with a parallel access volume;

determining if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume;

operative if the base logical volume associated with said parallel access volume does not differ from the original base logical volume associated with said parallel access volume, unassigning from said logical volume group said base logical volume associated with said

parallel access volume;

operative if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume:

reassigning the alias associated with said parallel access volume to said original base logical volume associated with said parallel access volume;

unassigning from said logical volume group the base logical volume associated with said parallel access volume.

10. (currently amended) ~~The method of claim 1, further comprising the steps of:~~

A method to control access to logical volumes disposed in an information storage and retrieval system using parallel access volumes, comprising the steps of:

providing an information storage and retrieval system comprising a plurality of logical volumes;

providing a plurality of host computers, wherein each of said plurality of host computers is capable of communicating with said information storage and retrieval system;

forming (N) host computer groups, wherein (N) is greater than or equal to 1;

assigning each host computer to the a host computer group;

forming (N) logical volume groups;

assigning one or more of said plurality of logical volumes to a logical volume group;

creating a parallel access volume having an alias;

persistently associating said parallel access volume with a base logical volume, wherein said base logical volume is assigned to the (i)th logical volume group, wherein (i) is greater than or equal to 1 and less than or equal to (N);

permitting each host computer assigned to the (i)th host computer group to access said parallel access volume.

receiving a request to delete the base logical volume associated with a parallel access volume;

determining if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume;

operative if the base logical volume associated with said parallel access volume does not differ from the original base logical volume associated with said parallel access volume, deleting the base logical volume associated with said parallel access volume;

operative if the base logical volume associated with said parallel access volume differs from the original base logical volume:

reassigning said alias associated with said parallel access volume to said original base logical volume associated with said parallel access volume;

deleting the base logical volume associated with said parallel access volume.

11. Canceled.

12. Canceled.

13. Canceled.

14. Canceled.

15. Canceled.

16. Canceled.

17. Canceled.

18. (currently amended) ~~The article of manufacture of claim 11, said computer readable~~

~~program code further comprising a series of computer readable program steps to effect:~~

An article of manufacture comprising a computer readable medium having computer readable program code disposed therein to control access to logical volumes disposed in an information storage and retrieval system using parallel access volumes, wherein said information storage and retrieval system comprises a plurality of logical volumes, and wherein a plurality of host computers are capable of communicating with said information storage and retrieval system, and wherein one or more of said logical volumes are assigned to one of (N) logical volume groups wherein (N) is greater than or equal to 1, and wherein each host computer is assigned to one of (N) host computer groups, the computer readable program code comprising a series of computer readable program steps to effect:

receiving a request from one of said plurality of host computers to access a designated logical volume, wherein said requesting host is assigned to the (j)th host computer group;

determining if said designated logical volume is a parallel access volume comprising an alias;

operative if said designated logical volume is a parallel access volume, determining if the base logical volume persistently associated with said parallel access volume is assigned to the (j)th logical volume group;

operative if the base logical volume persistently associated with said parallel access volume is assigned to the (j)th logical volume group, permitting said requesting host computer to access said designated logical volume;

receiving a request to assign to a logical volume group the base logical volume associated with a parallel access volume;

determining if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume;

operative if the base logical volume associated with said parallel access volume does not differ from the original base logical volume associated with said parallel access volume, assigning the base logical volume associated with said parallel access volume to said logical volume group;

operative if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume:

reassigning the alias for said parallel access volume to said original base logical volume; and

assigning to said logical volume group said base logical volume associated with said parallel access volume.

19. (currently amended) ~~The article of manufacture of claim 11, said computer readable program code further comprising a series of computer readable program steps to effect:~~

An article of manufacture comprising a computer readable medium having computer readable program code disposed therein to control access to logical volumes disposed in an information storage and retrieval system using parallel access volumes, wherein said information storage and retrieval system comprises a plurality of logical volumes, and wherein a plurality of host computers are capable of communicating with said information storage and retrieval system, and wherein one or more of said logical volumes are assigned to one of (N) logical volume groups wherein (N) is greater than or equal to 1, and wherein each

host computer is assigned to one of (N) host computer groups, the computer readable program code comprising a series of computer readable program steps to effect:

receiving a request from one of said plurality of host computers to access a designated logical volume, wherein said requesting host is assigned to the (j)th host computer group;

determining if said designated logical volume is a parallel access volume comprising an alias;

operative if said designated logical volume is a parallel access volume, determining if the base logical volume persistently associated with said parallel access volume is assigned to the (j)th logical volume group;

operative if the base logical volume persistently associated with said parallel access volume is assigned to the (j)th logical volume group, permitting said requesting host computer to access said designated logical volume;

receiving a request to unassign from a logical volume group the base logical volume associated with a parallel access volume;

determining if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume;

operative if the base logical volume associated with said parallel access volume does not differ from the original base logical volume associated with said parallel access volume, unassigning from said logical volume group said base logical volume associated with said parallel access volume;

operative if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume;

reassigning the alias associated with said parallel access volume to said original base logical volume associated with said parallel access volume;

unassigning from said logical volume group the ~~current~~ base logical volume associated with said parallel access volume.

20. (currently amended) ~~The article of manufacture of claim 11, said computer readable program code further comprising a series of computer readable program steps to effect:~~

An article of manufacture comprising a computer readable medium having computer readable program code disposed therein to control access to logical volumes disposed in an information storage and retrieval system using parallel access volumes, wherein said information storage and retrieval system comprises a plurality of logical volumes, and wherein a plurality of host computers are capable of communicating with said information storage and retrieval system, and wherein one or more of said logical volumes are assigned to one of (N) logical volume groups wherein (N) is greater than or equal to 1, and wherein each host computer is assigned to one of (N) host computer groups, the computer readable program code comprising a series of computer readable program steps to effect:

receiving a request from one of said plurality of host computers to access a designated logical volume, wherein said requesting host is assigned to the (j)th host computer group;

determining if said designated logical volume is a parallel access volume comprising an alias;

operative if said designated logical volume is a parallel access volume, determining if the base logical volume persistently associated with said parallel access volume is assigned to

the (j)th logical volume group;

operative if the base logical volume persistently associated with said parallel access volume is assigned to the (j)th logical volume group, permitting said requesting host computer to access said designated logical volume;

receiving a request to delete the base logical volume associated with a parallel access volume;

determining if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume;

operative if the base logical volume associated with said parallel access volume does not differ from the original base logical volume associated with said parallel access volume, deleting the base logical volume associated with said parallel access volume;

operative if the base logical volume associated with said parallel access volume differs from the original base logical volume:

reassigning said alias associated with said parallel access volume to said original base logical volume associated with said parallel access volume;

deleting the base logical volume associated with said parallel access volume.

21. Canceled.

22. Canceled.

23. Canceled.

24. Canceled.

25. Canceled.

26. Canceled.

27. Canceled.

28. (currently amended) ~~The computer program product of claim 21, further comprising:~~

A computer program product embodied in a computer readable medium, said computer program product usable with a programmable computer processor to control access to logical volumes disposed in an information storage and retrieval system using parallel access volumes, wherein said information storage and retrieval system comprises a plurality of logical volumes, and wherein a plurality of host computers are capable of communicating with said information storage and retrieval system, and wherein one or more of said logical volumes are assigned to one of (N) logical volume groups wherein (N) is greater than or equal to 1, and wherein each host computer is assigned to one of (N) host computer groups, comprising:

computer readable program code which causes said programmable computer processor to receive a request from one of said plurality of host computers to access a designated logical volume, wherein said requesting host is assigned to the (j)th host computer group;

computer readable program code which causes said programmable computer processor to determine if said designated logical volume is a parallel access volume comprising an alias, wherein said parallel access volume is persistently associated with an original base logical volume, and wherein said plurality of logical volumes includes said original base logical volume;

computer readable program code which, if said designated logical volume is a parallel access volume, causes said programmable computer processor to determine the base logical

volume associated with said parallel access volume;

computer readable program code which causes said programmable computer processor to determine if said base logical volume is assigned to the (j)th logical volume group;

computer readable program code which, if said base logical volume is assigned to the (j)th logical volume group, causes said programmable computer processor to permit said requesting host computer to access said base logical volume;

computer readable program code which, if said base logical volume is not assigned to the (j)th logical volume group, causes said programmable computer processor to disallow access by said requesting host computer to said base logical volume;

computer readable program code which causes said programmable computer processor to receive a request to assign to a logical volume group the current base logical volume associated with a parallel access volume;

computer readable program code which causes said programmable computer processor to determine if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume;

computer readable program code which, if the base logical volume associated with said parallel access volume does not differ from the original base logical volume associated with said parallel access volume, causes said programmable computer processor to assign the base logical volume associated with said parallel access volume to said logical volume group;

computer readable program code which, if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume, causes said programmable computer processor to:

reassign the alias for said parallel access volume to said original base logical volume;
and

assign to said logical volume group said base logical volume associated with said parallel access volume.

29. (currently amended) ~~The computer program product of claim 21, further comprising:~~

A computer program product embodied in a computer readable medium, said computer program product usable with a programmable computer processor to control access to logical volumes disposed in an information storage and retrieval system using parallel access volumes, wherein said information storage and retrieval system comprises a plurality of logical volumes, and wherein a plurality of host computers are capable of communicating with said information storage and retrieval system, and wherein one or more of said logical volumes are assigned to one of (N) logical volume groups wherein (N) is greater than or equal to 1, and wherein each host computer is assigned to one of (N) host computer groups, comprising:

computer readable program code which causes said programmable computer processor to receive a request from one of said plurality of host computers to access a designated logical volume, wherein said requesting host is assigned to the (j)th host computer group;

computer readable program code which causes said programmable computer processor to determine if said designated logical volume is a parallel access volume comprising an alias, wherein said parallel access volume is persistently associated with an original base logical volume, and wherein said plurality of logical volumes includes said original base logical

volume;

computer readable program code which, if said designated logical volume is a parallel access volume, causes said programmable computer processor to determine the base logical volume associated with said parallel access volume;

computer readable program code which causes said programmable computer processor to determine if said base logical volume is assigned to the (j)th logical volume group;

computer readable program code which, if said base logical volume is assigned to the (j)th logical volume group, causes said programmable computer processor to permit said requesting host computer to access said base logical volume;

computer readable program code which, if said base logical volume is not assigned to the (j)th logical volume group, causes said programmable computer processor to disallow access by said requesting host computer to said base logical volume;

computer readable program code which causes said programmable computer processor to receive a request to unassign from a logical volume group the current base logical volume associated with a parallel access volume;

computer readable program code which causes said programmable computer processor to determine if the current base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume;

computer readable program code which, if the base logical volume associated with said parallel access volume does not differ from the original base logical volume associated with said parallel access volume, causes said programmable computer processor to unassign from said logical volume group said base logical volume associated with said parallel access volume;

computer readable program code which, if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume, causes said programmable computer processor to:

reassign the alias associated with said parallel access volume to said original base logical volume associated with said parallel access volume;

unassigning from said logical volume group the base logical volume associated with said parallel access volume.

30. (currently amended) ~~The computer program product of claim 31-21, further comprising:~~

A computer program product embodied in a computer readable medium, said computer program product usable with a programmable computer processor to control access to logical volumes disposed in an information storage and retrieval system using parallel access volumes, wherein said information storage and retrieval system comprises a plurality of logical volumes, and wherein a plurality of host computers are capable of communicating with said information storage and retrieval system, and wherein one or more of said logical volumes are assigned to one of (N) logical volume groups wherein (N) is greater than or equal to 1, and wherein each host computer is assigned to one of (N) host computer groups, comprising:

computer readable program code which causes said programmable computer processor to receive a request from one of said plurality of host computers to access a designated logical volume, wherein said requesting host is assigned to the (j)th host computer group;

computer readable program code which causes said programmable computer processor to determine if said designated logical volume is a parallel access volume comprising an alias,

wherein said parallel access volume is persistently associated with an original base logical volume, and wherein said plurality of logical volumes includes said original base logical volume;

computer readable program code which, if said designated logical volume is a parallel access volume, causes said programmable computer processor to determine the base logical volume associated with said parallel access volume;

computer readable program code which causes said programmable computer processor to determine if said base logical volume is assigned to the (j)th logical volume group;

computer readable program code which, if said base logical volume is assigned to the (j)th logical volume group, causes said programmable computer processor to permit said requesting host computer to access said base logical volume;

computer readable program code which, if said base logical volume is not assigned to the (j)th logical volume group, causes said programmable computer processor to disallow access by said requesting host computer to said base logical volume;

computer readable program code which causes said programmable computer processor to receive a request to delete the base logical volume associated with a parallel access volume;

computer readable program code which causes said programmable computer processor to determine if the base logical volume associated with said parallel access volume differs from the original base logical volume associated with said parallel access volume;

computer readable program code which, if the base logical volume associated with said parallel access volume does not differ from the original base logical volume associated with said parallel access volume, causes said programmable computer processor to delete the base

logical volume associated with said parallel access volume;

computer readable program code which, if the base logical volume associated with said parallel access volume differs from the original base logical volume, causes said programmable computer processor to:

reassign said alias associated with said parallel access volume to said original base logical volume associated with said parallel access volume;

delete the base logical volume associated with said parallel access volume.